

REMARKS

This is in response to the Office Action mailed on July 12, 2006. In the Office Action, claims 1-54 were pending and rejected.

Claims 1-41 stand rejected under 35 U.S.C. § 101 as being allegedly being directed toward non-statutory subject matter. Applicants have amended independent claim 1 to include the step of "providing an output indicative of an association between dependency structures from two different languages". The MPEP states, in § 2106.IV.B.1.b.i, that "[a]nother statutory process is one that requires the measurements of physical objects or activities to be transformed outside of the computer into computer data, where the data comprises signals corresponding to physical objects or activities external to the computer system, and where the process causes a physical transformation of the signals which are intangible representations of the physical objects or activities." (Citations omitted.)

Applicants respectfully submit that the subject matter of claim 1 is directed to statutory material at least as is described by the above-mentioned provision. Claim 1 is directed toward a computer-implemented method of associating dependency structures from two different languages. The languages include physical objects, words, as represented at least by textual forms.

The data in the dependency structures of claim 1 are intangible representations of physical objects, that is a physical representation of the dependency structure. The method in claim 1 includes the step of aligning nodes of the dependency structures, which serves to cause a physical transformation of the signals that represent the physical manifestation of a dependency structure. Claim 1 thus provides an output that is the result of a physical transformation of signals, which, in turn, are

intangible representations of aligned dependency structures of the two languages. Thus, Applicants submit that the subject matter of claim 1 satisfies the statutory requirements of 35 U.S.C. § 101.

Similarly, Applicants submit that independent claim 24 is drawn to patentable subject matter for substantially the same reasons described above relative to claim 1. Applicants thus respectfully submit that claims 1 and 24, as well as claims 2-23 and claims 25-41, which depend from claims 1 and 24, respectfully are drawn to statutory subject matter. Withdrawal of the rejection is respectfully requested.

Claims 42-54 stand rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by U.S. Pat. No. 5,477,450 of Takeda et al. (hereinafter "Takeda"). Independent claim 42 is directed toward a computer readable media having information stored thereon for use by a computer-implemented machine translation system to translate a text input from a first language to a second language. The information comprises a plurality of mappings. At least some of the mappings correspond to "dependency structures of the first language having varying context with some common elements, and associated dependency structures of the second language to the dependency structures of the first language also having varying context with some common elements."

Claim 42 has been amended to further clarify the invention recited therein. Claim 42 recites that the stored information on the computer readable media is "for use by a computer-implemented machine translation system" to "translate a text input from a first language to a second language". The stored information of claim 42 is not an input text itself, nor is it any representation of the input text. Rather, the stored information is information used by a machine translation system to

translate input text later received by the system. This stored information includes a plurality of mappings of the type described above. On page 3, the Office Action asserts that Takeda provides a teaching of a plurality of mappings, each mapping indicative of associating a dependency structure of the first language with a dependency structure of the second language, and cites Takeda, col. 6, ll. 60-67 as support for the assertion. Applicants respectfully disagree with this assertion.

As preliminary matter, the Applicants respectfully disagree with the assertion in Office Action that Takeda teaches a "main element [with] a one-for-many correspondence to the constituents". Applicants point out that that what Takeda actually states at col. 6, ll. 60-64 is that its "input text analyzer" "represents a structure obtained through analyzing an input text not by a tree structure wherein the main element has a one-for-many correspondence to the constituents but by a graph structure." (Emphasis added.) Thus, Applicants point out that plain language recited in Takeda clearly teaches away from what the Office Action asserts that it teaches. Even if there were a "one-for-many tree structure" in Takeda, there is no indication that there is a plurality of mappings. Applicants submit that the teaching of a single tree structure, even if it is a "one-for-many" tree structure is still a single tree structure and does not teach a plurality of mappings. Regardless, Applicants respectfully submit that this is a moot point, as the Takeda reference expressly disclaims a "one-for-many" tree structure. Applicants submit then, that Takeda doesn't teach a "plurality of mappings" here. Further, there does not appear to be any other language provided in Takeda that teaches or suggests a plurality of mappings.

More importantly, Applicants assert that in the cited text, Takeda is actually discussing manipulating the "input text"

itself and is not providing any teaching of stored information used by a machine translation system to translate the input text. At col. 6, ll. 64-66, Takeda states that "[t]he graph structure expresses modificatory relations, such as a dependency structures or case structures, with regard to an input text." Furthermore, there is absolutely no teaching or suggestion that the graph structure has an association with a dependency structure in a second language. Takeda is thus referring to a graph structure creating as a consequence of manipulating the input text and describes how the graph structure is created, which is not the same as a plurality of mappings with associations between dependencies in first and second languages.

In fact, Takeda is directed toward a substantially different type of translation system. As discussed above, Takeda teaches manipulating the input text in an input language into a graph structure. Then, Takeda assigns potential meanings to the words in the graph structure in a translated language from a bilingual dictionary. (See, e.g., Takeda, col. 7, ll. 34-37.) A word in the input text may have several different meanings in the translated language. Takeda teaches a constraint solver that can eliminate some combinations in the translated language that are "incapable of being solutions." (*Id.* at col. 9, ll. 67.) The constraint solver has no apparent mapping with associations between the input language and the translated language. Instead, the constraint solver appears to function independent of the input language.

The Office Action asserts that in col. 10, ll. 5-17 Takeda teaches the recited mappings including associations of dependency structures because certain combinations of words that need to be resolved by the constraint solver can have different contexts. However, Takeda here is merely teaching the resolution of different words in the translated language selected from a

bilingual dictionary into a narrowed down list of alternatives based on whether the words have a probability of being associated together in the translated language. As discussed above, the constraint solver used to narrow down the list of acceptable alternatives has no apparent association at all with the input language. Thus, not only does Takeda provide any teaching of a plurality of mappings, it provides no teaching of a single mapping that associates a dependency structure in a first language with one in a second language. Nor does it teach that some mappings correspond to dependency structures of the first language having varying context with some common elements and dependency structures of the second language with the same.

The invention recited in claim 42 has some important advantages. The stored mappings provide a training function for the machine translation system. By providing stored information having mappings between the first language and the second language with overlapping context, fluency and general applicability of the mappings is maintained by the machine translation system. In particular, it is possible to translate from the first language to the second language even if a particular text to be translated is not in the mappings. In addition, large mappings provide a more fluent translation between the first language and the second language. Takeda does not contemplate a system of this type and cannot provide these kinds of advantages.

For at least these reasons, the Applicants submit that claim 42 is allowable over Takeda. Claims 43-54 depend directly or indirectly from claim 42 and are believed to be separately patentable. Withdrawal of the rejection is respectfully requested.

In view of the remarks and amendments made herein, Applicants submit that claims 1-54 are allowable over the cited art. A Notice of Allowance is respectfully requested.

The Director is authorized to charge any fee deficiency required by this paper or credit any overpayment to Deposit Account No. 23-1123.

Respectfully submitted,

WESTMAN, CHAMPLIN & KELLY, P.A.

By: 

Steven M. Koehler, Reg. No. 36,188  
900 Second Avenue South, Suite 1400  
Minneapolis, Minnesota 55402  
Phone: (612) 334-3222 Fax: (612) 334-3312